Talking Head User Interfaces

Ladislav Kunc

Computer Graphics Group

CTU in Prague

CGG

Motivation

- ECA – user interface metaphor
  - human-like behaviour, good for elderly people
- ECA = embodied conversational agent
- Synthetic agents

  ↓

- Need for efficient programming language
- Support for modalities channels
- Need of programmable ECA application toolkit

Motivation Video

- Example of ECA based application: greeting user, ECA reaction to user's action, idle state

ECAF Applications – GrandmaTV

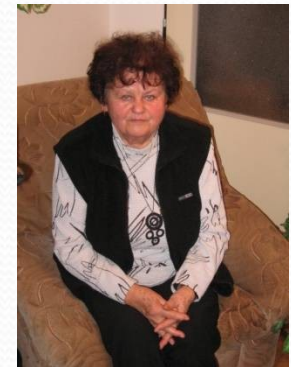- Dynamic ECA-based automatic presentations from structured data

Navigation tree:
- test
  - dad Karel
    - football
  - family Novakovi

dad Karel - football
what: *play football with friends*
when: *Wednesday (weekly)*
where: *football playground in Prague*

multimedia
- sound.mp3
- video.avi
- picture1.jpg
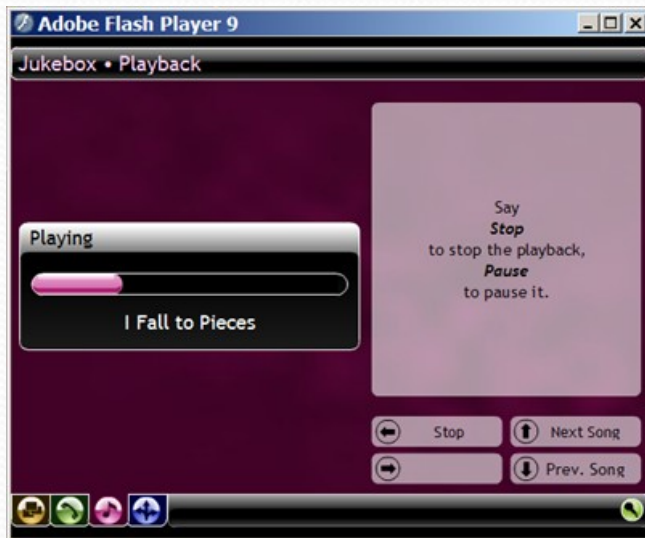- picture2.png
- picture3.bmp

- Additional possibility of social contact with elderly people

GrandmaTV Mock-up Video

ECAF Applications – Jukebox Demo

- ECA interface for IBM Voice Jukebox application
- Development of fully-functional application is in progress

"Classical" Jukebox Interface
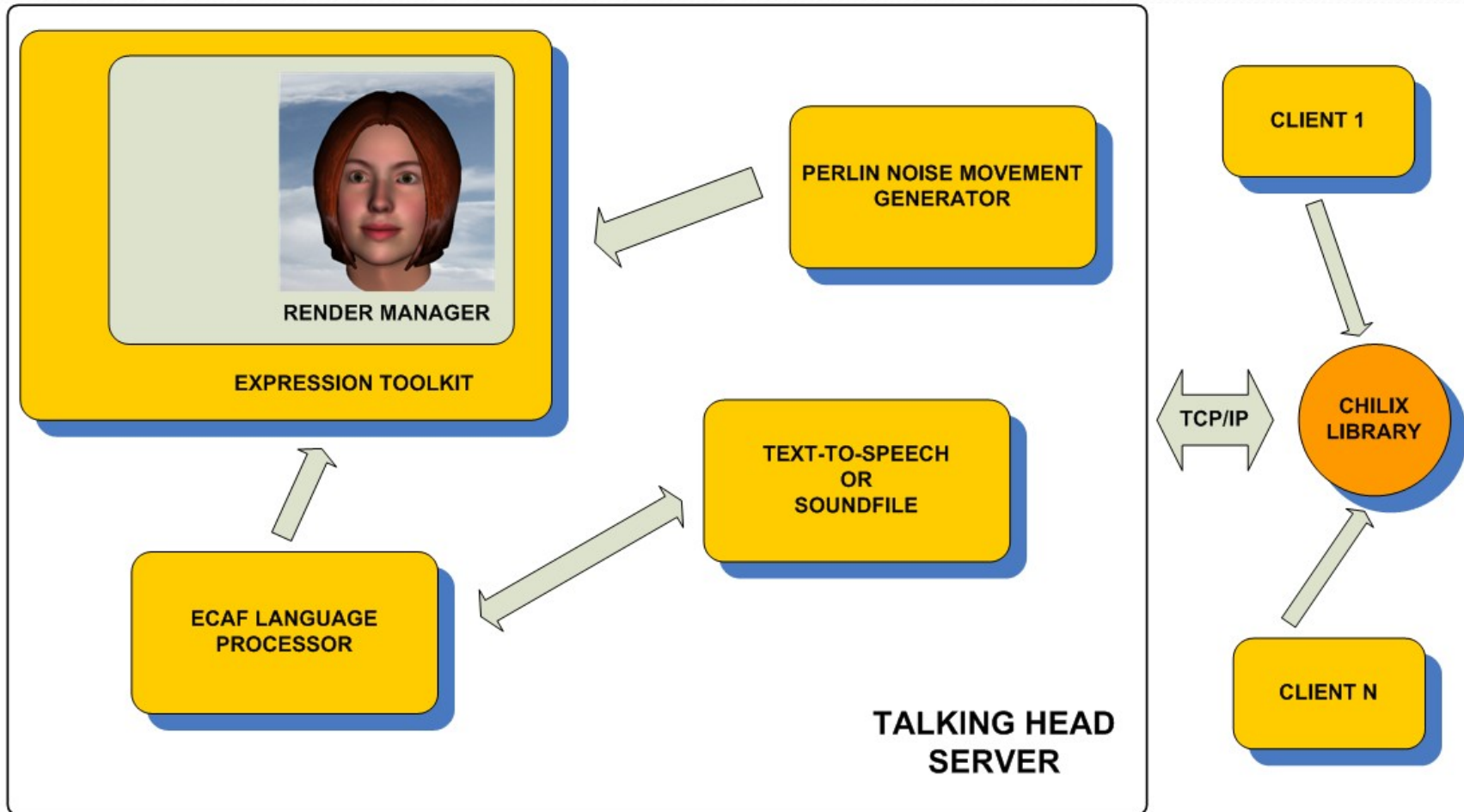

"ECA-based" Jukebox Interface

IBM Jukebox – ECA Interface
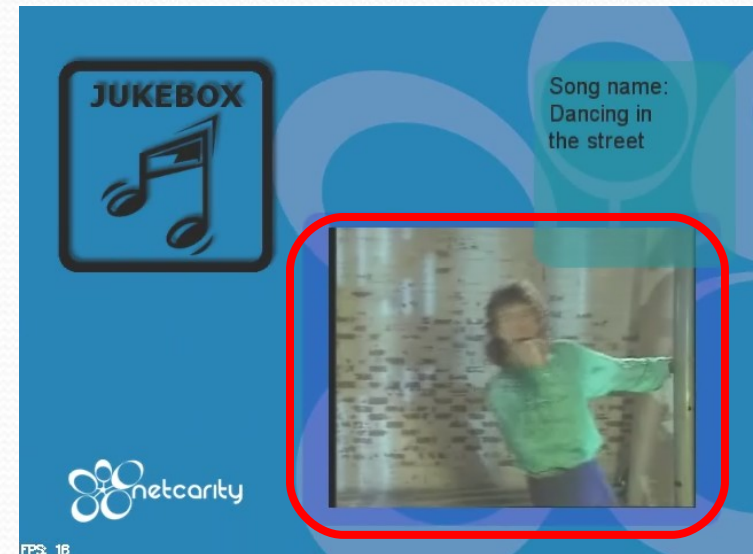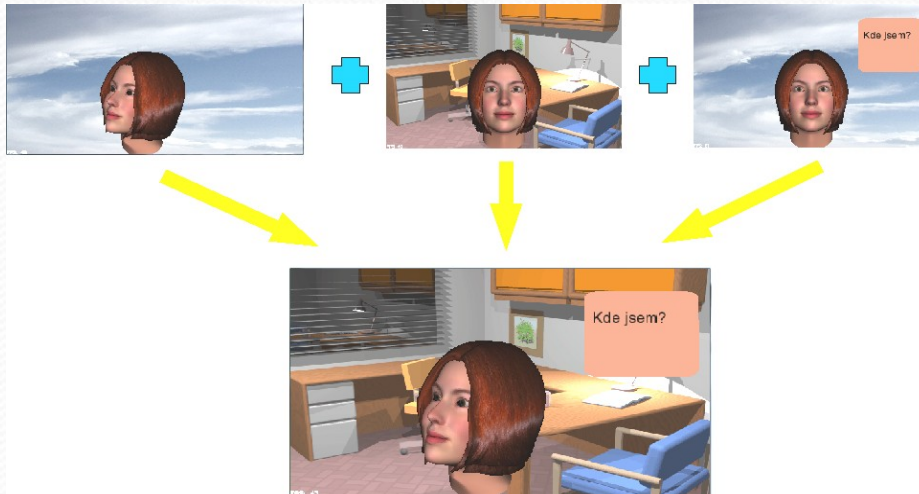
ECAF – Talking Head

- ECA = embodied conversational agent
- F = facade or framework

- Implemented in C++ using OpenGL
- Pseudo-muscle facial animation (open-source Expression toolkit)
- ECAF (XML) script driven
- IBM ViaVoice Text-To-Speech or pre-recorded prompts
- Remote access over Chilix (TCP/IP) library

ECAF Architecture

ECAF Language

- 13 communications channels
- Head turning, eye pointing, expressions dynamic background picture (sliding, transitions, zooming), PIP video, etc.
- Blending of channels

PIP video

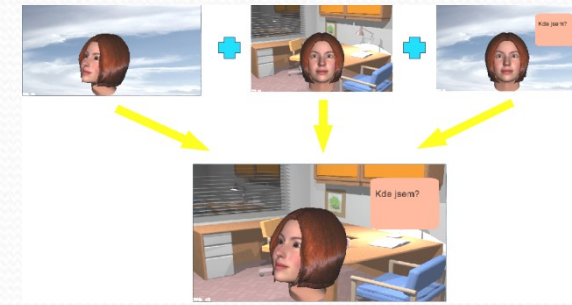# ECAF Talking Head Evolution

future

near future

now

before

first version

Conclusion

- ECAF – language with high level of agent behavior generation
- Application developer – proper mix of expressiveness

GrandmaTV and Jukebox case study

Modalities blending

- New OGRE based engine, whole body control

Publications

- Ladislav Kunc, Jan Kleindienst. ECAF: Authoring Language for Embodied Conversational Agents. In proc. of Text, Speech and Dialogue (TSD'07), Plzeň, Czech Republic, LNCS 4629, pp. 206-213 , Springer-Verlag, 2007.

- Ladislav Kunc, Jan Kleindienst, Pavel Slavík. Talking Head as Life Blog. In proc. of Text, Speech and Dialogue (TSD'08), Brno, Czech Republic, LNAI, Springer-Verlag, September 2008 (accepted for publication)

- Ladislav Kunc, Pavel Slavík. Talking Head – Visualizations and Level of Detail. 12th International Conference on Information Visualisation. London, UK. Published by IEEE. July 2008 (accepted for publication)

- Jan Kleindienst, Jan Cuřín, Ladislav Kunc, Luboš Ureš. Voice-driven Jukebox with ECA Interface. The Tenth International Conference on Multimodal Interfaces (ICMI). To be published by ACM. October 2008. (submitted)

End…

Thank you for your attention…

Ladislav Kunc (kuncl1@fel.cvut.cz)

Pure ECAF Language Example

```
<ecaf>
  <speak>Hello everybody!</speak>
  <speak>How are you?<gesture expr="smile"
    expr_scale="0.8">I am fine.</gesture>
    Now I will turn eyes and head and
    <gesture eye_vert="20"> I  will see
    <gesture head_angle="-25" persistent="true"/>
    something up there.</gesture>
  </speak>
</ecaf>
```

ECAF Example Video

New Talking Head Engine